Review

Functional constipation: a conservative first line approach

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Abstract: Functional Constipation (FC) is a common bowel disorder leading to restricted activity and a reduction in health-related quality of life. It is usually managed initially by increasing liquid intake, increasing or balancing the intake of soluble and non-soluble fiber, or using over the counter or prescription laxatives. However, these interventions are often ineffective and fail to address the underlying pathophysiology contributing to this condition. The knowledge and skills of practitioners well versed in a range of neuromusculoskeletal, manual and motor coordination skills, are a necessary adjunct in diagnosing and treating FC. This article focuses on Chronic Functional Constipation, and the conservative role that neuromuscular diagnosis and treatment offers. It seeks to inform professionals about the value of implementing a neuromuscular behavioral approach in the treatment of functional constipation.

Keywords: Electrotherapy; Functional/chronic constipation; Neuromuscular; Physical therapy; Visceral mobilization

INTRODUCTION

Constipation is a common gastrointestinal (GI) problem and its prevalence in adults has been estimated at 16% worldwide (varying from 0.7% to 79%). It is more common in women than in men and more common with age progression[1]. A person with chronic constipation (CC) may experience infrequent bowel movements, hard, difficult to pass stools, incomplete bowel movements or straining.

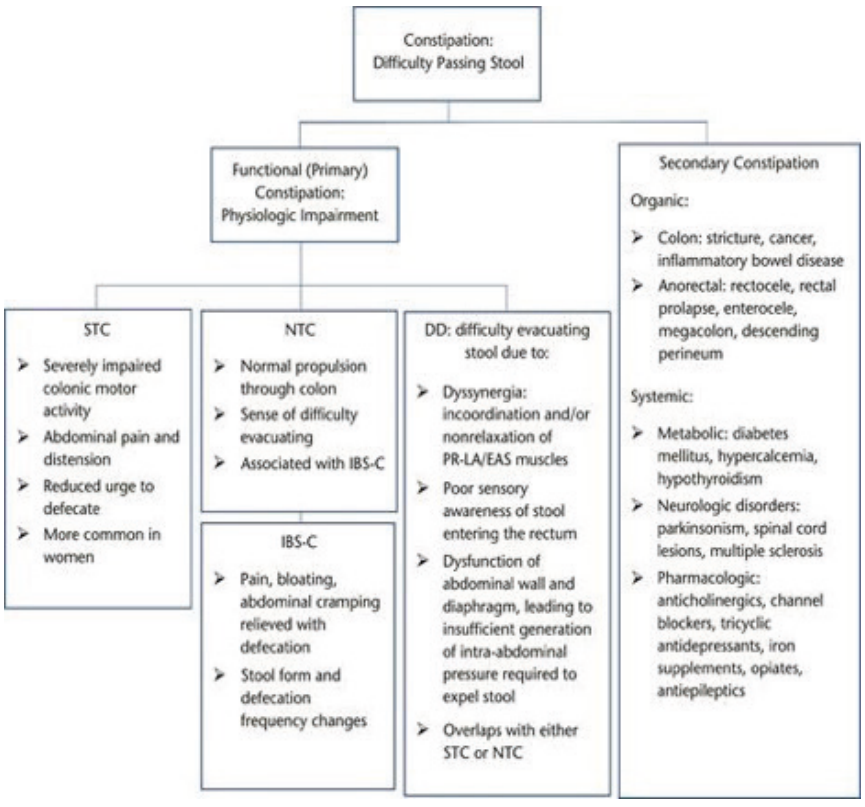
CC can be divided into two types[1,2]: primary constipation with functional impairment of colon and anorectal structures and secondary constipation related to disease or medications.

Figure 1 illustrates these two types of constipation and presents their characteristics and etiology.

Nerves and muscles help maintain continence until we decide to have a bowel movement. The pelvic floor muscles, together with anal sphincter muscles, must all relax in a coordinated way. At the same time the abdominal muscles and diaphragm need to work together to increase intra-abdominal pressure sufficiently in order to have a normal bowel movement. Failure of this to happen can lead to problems of constipation.

A survey of 100 patients with FC found that in nearly one-third (31%) of respondents the problem began in childhood. 29% appeared to have developed the problem after a particular event, such as pregnancy or injury. In the remaining 40% no cause was identified that may have brought on the condition. Within the same cohort, over half who developed the condition in adulthood reported the frequent or intermittent passage of hard stools. It may be that too much straining to expel hard stools over time is a factor leading to dyssynergic defecation. According to the Rome III diagnostic criteria, a diagnosis of functional constipation must include the presence of ≥2 of the following in at least 25% of defecations: straining, lumpy/hard stools, sensation of incomplete evacuation, sensation of anorectal obstruction or blockage, digital maneuvers to defecate, and <3 BMs per week. In addition, the diagnosis must include that loose stools are rarely present without use of laxatives, there are insufficient criteria for IBS, and the criteria must have been present for the past three months, with symptom onset at least six months prior to diagnosis. Although no one classification scheme fits all, these criteria appear to be widely accepted and provide a framework for further understanding. Functional constipation can be further divided into three general subgroups: normal transit constipation (NTC), slow transit constipation (STC), and defecation disorder (DD), as delineated in Figure 1.

Figure 1. Table outline of Chronic Constipation



GENERAL EXAMINATION

Treatment is based on a thorough evaluation of each patient. A patient's age and bio-psycho-social medical history need to be taken into account. Each patient is different, and treatment needs to be tailored to the individual.

Thoracoabdominal examination

should highlight respiration, particularly diaphragmatic, lower lateral and

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posterior thoracic excursion. There can also be an imbalance of excursion from side to side. There is often impairment in people who have low back pain, sacro-iliac joint impairment or pelvic pain. Thoracic spine, rib mobility and static and dynamic postural habits are important to examine as they can affect chest wall kinematics and breathing patterns. This is essential to the intra-abdominal force production required to effectively expel a stool. A screen of the lumbar spine, pelvic ring, hip joints and core stabilizers will identify impairments that might impede proper toileting positioning. Assessment of myofascial tissues from T10 to thighs, including perineal and intrapelvic structures, will identify soft tissue impairments such as an inability to release or contract muscles functionally, and affected motor coordination. Diastasis recti (DR), which is primarily seen in women, especially during pregnancy or postpartum, can interfere with the patient being able to develop enough intra-abdominal pressure to be able to functionally expel a stool.

TREATMENTS

Initially patients stay on their medication schedule and are slowly weaned off it as they become more confident of their own ability to control their physiology. Dietary and liquid intake, as well as psycho-social and behavioural treatments are an important aspect, but will not be addressed here, as these have been well documented. There is, however, a paucity of research and information on the physical medicine protocols related to these treatments[3]. Outlined below are the neuro-muscular physical therapies that have been shown to be effective.

Management of FC should consider treatments that target neuromuscular impairments (sensory and motor coordination) and correct behaviors that are detrimental to overall health, including bowel function. Such an approach will consider other pelvic symptoms that co-exist in people with bowel disorders.

FC can be associated with dysfunctional activities of daily living (ADL). Three examples are: using a Valsalva mechanism to urinate; hovering over toilets; and delaying urination and/or bowel movements (BMs). These behaviors can interfere with the relaxation of pelvic floor and urinary sphincter muscles during micturition. Hovering over a toilet can lead to excessive straining during BMs and could contribute to the development of DD, as well as to urinary dysfunction and the prolapse of pelvic organs (POP)[4].

Respiration. The majority of patients suffering with FC are anxious, feel hopeless, are bloated and often in pain. They mostly use shallow, fast, upper chest breathing. Their diaphragmatic, lower lateral and posterior costal respiration is poor. Good excursion of the lungs, in combination with appropriate transverse abdominus muscle concentric and eccentric contraction provides a continual compression and release of abdominal contents, resulting in stimulation of the bowel. When this is combined with paradoxical pelvic floor respiration, a physiological set up for more optimal peristalsis occurs, and mega excursion of the bowel is minimized. Breathing retraining is best started in a hook lying position, and then progressed to sitting, standing and developing the ability to incorporate appropriately in all ADL.

Physiological Toileting Technique

The Israeli doctor Sikirov[5] tested this idea for a 2003 study published in *Digestive Diseases and Sciences*. He had several dozen patients defecate in each of three positions: sitting on a 16-inch-high toilet, sitting on a 12-inch-high toilet, and squatting over a plastic container. Sikirov found that, when squatting, subjects averaged 51 seconds to move their bowels, versus 130 seconds when sitting on a high toilet. Subjects were more likely to rate the squatting experience as easier. Figure 2 demonstrates an effective method of simulating a squatting position. Figure 3 demonstrates how this position assists in releasing the puborectalis muscle, increasing the ano-rectal angle, thus facilitating physiological passing of stool.

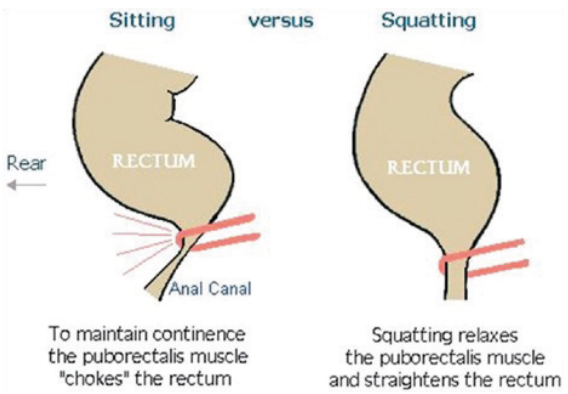
Figure 2. Toileting Posture

Today there are many commercially made devices to help increase hip and knee flexion while sitting on the type of pedestal toilets currently in use. However, something as simple as a small step stool, yoga blocks, or even large books placed under the feet work well. It is then advisable to lean forward from the hips, maintain a straight spine, and place forearms in a resting position on the thighs as shown in Figure 2.

Exercise. Few studies have examined the effects of physical exercise on colonic transit. As a clinician in this field, I have yet to find a client who did not benefit from some form of impact exercise and appropriate core strengthening during all ADL. This applies equally to patients who are challenged with conditions that make standing impossible. Patients with neurological symptoms where balance is affected, like Parkinson's Disease, Multiple Sclerosis, Cerebral Palsy, spinal cord injury or brain injury can be helped to sit on an exercise ball and bounce as this is a low impact activity.

Visceral Manipulation, also known as Abdominal Massage. Since 1999 there has been a growing number of studies demonstrating that abdominal massage can stimulate peristalsis, decrease colonic transit time, increase the frequency of bowel movements in constipated patients, and decrease the feelings of discomfort and pain that accompany them. There is also good evidence that massage can stimulate peristalsis in patients with post-surgical ileus. Individual case reports show that massage has been effective for patients with constipation as a result of a variety of diagnosed physiologic abnormalities, as well as in patients with long-term FC[6]. Figure 4A demonstrates an effective massage for the large bowel. It demonstrates using small circular clockwise

Figure 3. Postural change in anorectal angle



movements to stimulate and increase peristalsis in the ascending, transverse and descending colon. Figure 4B shows a firm stroking massage, known as the "I love you" massage. All strokes are repeated five times on an empty stomach. The I is for stroking down the descending colon. This is followed by the L (for Love) which is an upside down L stroked across the transverse colon from right to left, followed by a stroking down the descending colon and the U (for You) is an upside down U stroking up the ascending colon; across the transverse colon and down the descending colon (incorporating the entire large bowel). It is recommended for patients to perform this massage 3 times a day before meals as shown in Figure 4B.

Orthopedic Manual Therapy (OMT). OMT can be an effective treatment method for FC as it normalizes the colon transit time not only by lessening the symptoms of constipation but also by facilitating intestinal movements. Colon transit time is demonstrated in the following article: 30 subjects were measured before and after the interventions. 15 subjects were assigned to a Maitland OMT group, and 15 subjects were assigned to a dietary fiber group. The analysis of changes in colon transit time showed statistically significant differences in left colon transit time, rectosigmoid colon transit time, and total colon transit time for the OMT group. There were also statistically significant differences in rectosigmoid colon transit time and total colon transit time for the dietary fiber group. An analysis of group differences in the effects of OMT and dietary fiber intake showed that the former group achieved statistically significantly larger declines in rectosigmoid colon transit time and total colon transit time compared with the latter group[7].

Biofeedback. Biofeedback therapy has been shown to be effective by using neuromuscular training, assisted by visual, and verbal feedback. It is reported that > 70% of patients with gastrointestinal disorders eliminated symptoms through biofeedback therapy treatment. Biofeedback therapy is an efficient, multidisciplinary approach without adverse effects. It can be used during pregnancy or even with a patient who has cancer. The equipment is safe to use, as it only reads and records the patient's electromyographic activity. There is sensitive biofeedback equipment available using sophisticated hardware and software. A computer screen showing visual and auditory feedback assists the patient in learning the sensations associated with isolated pelvic muscle contraction and release, as well as learning what an effective bear down mechanism feels like. This is useful as an in-office treatment, as patient progress and statistical information can be saved and compared over time. A simpler unit is useful as a home trainer, so patients can practice what they have been taught in clinic[8].

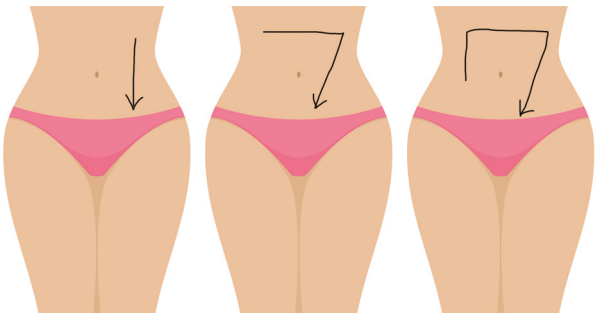


Figure 4B. I Love U Bowel Massage

During biofeedback therapy, either a sensor is placed in the anus or external sensors are placed on either side of the anus to give visual and auditory feedback of muscle function. Figure 5 demonstrates how a patient with paradoxical puborectalis contraction can learn how to relax their muscles when they bear down, in order to eliminate stool.

Alternatives to Biofeedback Therapy. There are also excellent non-technical and low-cost feedback methods.

1) A patient can *visualize* their perineum while in a physiological position to empty their bowel. A *yoga head stander* is ideal for this. The patient sits on the equipment, which has an opening in its seat that exposes the perineum. With a mirror placed under the equipment on the floor, the patient can clearly see their anal opening. A lighting source enhances visibility, and the patient is able to see their pelvic diaphragm function. Cueing facilitates contraction and relaxation of their pelvic diaphragm muscles. Patient observes what their bear down mechanism looks like, and how to train it.

2) The patient can use a *finger intra-anally* to monitor and train anal sphincter function.

3) Patients can be taught to effectively reverse outlet DD by inserting an *anal sensor*, mostly used for technical intra-anal biofeedback, into their anus, and expelling it gently against slight resistance from their finger. This maneuver can be repeated several times to retrain efficient stool emptying. Similarly, an *anal dilator*, which is flat at the end, like the *Milex* brand, is easier to use as it comes in different sizes.

Balloon-Assisted Training. Patients who are unable to sense when their rectum needs to be emptied can develop a mega-rectum, where the rectum is no longer able to contract and assist in bowel emptying. Using balloon

Figure 4A. Large Colon Massage

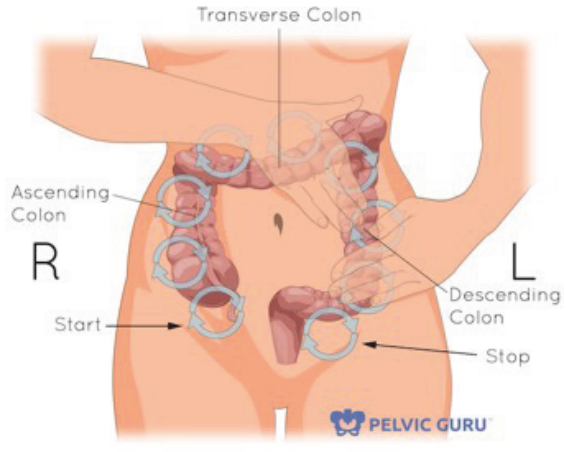
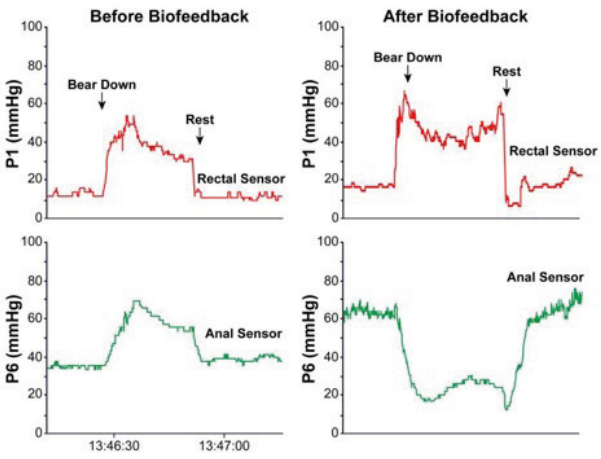


Figure 5. Biofeedback showing dyssenergic and functional pelvic muscle readings



training, a small, soft balloon is inserted into the rectum and is attached to a large syringe that will inject either water or air into the balloon, causing the balloon to enlarge within the rectum. This training technique provides feedback about the sensation of rectal filling, including the volume where the patient perceives urges to defecate. Over time the volume of water or air is diminished, so that patients learn to recognise earlier cues to empty.
Myofascial Trigger Point Release. A manual scan of a patient's myofascial tissue will quickly identify the areas of restriction in soft tissue. Initially, gentle rolling of the skin, or palpation of the superficial layer of abdominal and thoracic fascia and muscle will determine the areas that need release. Deeper palpation of the muscle tissue will reveal any tender trigger points, or fascial and muscle restrictions. Patients can easily be shown how to release these tissues. With CC there are three main findings:
1) Tight tissue over the area, which tends to be protective tightness. The areas of restriction are generally under the rib cage; diaphragm; superficial abdominal muscles; psoas and iliacus (which lies under the sigmoid colon.)
2) Scar tissue in all layers, including the greater and lesser omentum and mesenteries.
3) Loose low-tone tissue and muscle with no resistance or tone to assist in respiratory pumping motion, or ability to assist in increasing abdominal pressure to aid in stool evacuation.
Peri-Anal and Vaginal Splinting. Perianal pressure/splinting is a way to help move the stool out of a rectocele, so it can find the anal opening directly. Either (1) a patient's thumb or available commercial tool is inserted into the vagina (to support the posterior vaginal wall) or (2) a patient's forefinger and middle finger are placed on either side of anus (which is able to support a stretched perineum). There are times when both maneuvers are used simultaneously[9].
Interferential Current. Recent research has shown the efficacy of interferential current stimulation in the daily home treatment of children with CC. Four adhesive surface electrodes, two abdominal and two paraspinal produce two sinusoidal currents crossing the body. There is also a version that works anteriorly. Treatment is for up to three months. To date, only one open-label study has evaluated this technique in adults but it has shown encouraging results with an efficiency in 7/11 patients (63.6 %) in the number of stools, severity score of constipation and quality of life score[10].
Internal Anal Electrical Stimulation. Electrical stimulation therapy (EST) of the gastrointestinal tract has been used to treat gastric motor dysfunction since 1963. EST in the colon may be an alternative to conventional treatments, such as biofeedback and surgery. Most EST procedures are regarded as invasive but EST using an anal electrode is non-invasive. It has been shown to be successful in up to 60% of patients with fecal incontinence. It is a useful tool to treat ano-rectal hyposensitivity and useful in situations where patients are unable to generate a pelvic muscle contraction or release[11].

CONCLUSION

Patients diagnosed with FC need to be taught the biomechanics of defecation. Diet, fiber, liquid intake and exercise must be managed. Bowel massage, biofeedback, balloon training, electrical stimulation and interferential stimulation may be employed when necessary.
There are no adverse side effects to implementing a neuromuscular treatment approach for FC. It is inexpensive when compared to medical or surgical management and patients can usually become self-efficient in their own care after 4-6 treatments. It may save refractory patients from more invasive or radical procedures such as colostomies or surgery. This article advocates early referral to professionals familiar with a neuromuscular behavioural approach.

REFERENCES

1. Forootan M, Bagheri N, Darvishi M. Chronic constipation: A review of literature. Medicine (Baltimore). 2018;97(20):e10631. doi:10.1097/MD.0000000000010631. PubMed PMID: 29768326; PubMed Central PMCID: PMCPMC5976340.
2. George SE, Borello-France DF. Perspective on Physical Therapist Management of Functional Constipation. Phys Ther. 2017;97(4):478-93. Epub 2016/09/17. doi: 10.2522/ptj.20160110. PubMed PMID: 27634920.
3. Rao SS, Meduri K. What is necessary to diagnose constipation? Best Pract Res Clin Gastroenterol. 2011;25(1):127-40. Epub 2011/03/09. doi: 10.1016/j.bpg.2010.11.001. PubMed PMID: 21382584; PubMed Central PMCID: PMCPMC3063397.
4. George SE, Borello-France DF. Perspective on Physical Therapist Management of Functional Constipation. Phys Ther. 2017;97(4):478-93. Epub 2016/09/17. doi: 10.2522/ptj.20160110. PubMed PMID: 27634920.
5. Sikirov, D. Comparison of straining during defecation in three positions: results and implications for human health. Dig Dis Sci. 2003 Jul;48(7):1201-5. doi: 10.1023/A:1024180319005. PMID: 12870773
6. Sinclair M. The use of abdominal massage to treat chronic constipation. J Bodyw Mov Ther. 2011;15(4):436–445. doi: 10.1016/j.jbmt.2010.07.007.
7. Koo JP, Choi JH, Kim NJ. The effects of maitland orthopedic manual therapy on improving constipation. J Phys Ther Sci. 2016;28(10):2857-61. Epub 2016/11/09. doi: 10.1589/jpts.28.2857. PubMed PMID: 27821950; PubMed Central PMCID: PMCPMC5088141.
8. Forootan M, Bagheri N, Darvishi M. Chronic constipation: A review of literature. Medicine (Baltimore). 2018;97(20):e10631. doi:10.1097/MD.0000000000010631. PubMed PMID: 29768326; PubMed Central PMCID: PMCPMC5976340.
9. Apostolis C, Wallace K, Sasson P, Hacker MR, Elkadry E, Rosenblatt PL. Assessment of women with defecatory dysfunction and manual splinting using dynamic pelvic floor magnetic resonance imaging. Female Pelvic Med Reconstr Surg. 2012 Jan-Feb;18(1):18-24. doi: 10.1097/SPV.0b013e31823bdb98. PMID: 22453259; PMCID: PMC3707403.
10. Vitton V, Benezech A, Honore S, Sudour P, Lesavre N, Auquier P, et al. CON-COUR study: Interferential therapy in the treatment of chronic constipation in adults: study protocol for a randomized controlled trial. Trials. 2015;16:234. Epub 2015/05/28. doi: 10.1186/s13063-015-0752-8. PubMed PMID: 26012788; PubMed Central PMCID: PMCPMC4486681.
11. Jung KW, Yang DH, Yoon IJ, Seo SY, Koo HS, Lee HJ, et al. Electrical stimulation therapy in chronic functional constipation: five years' experience in patients refractory to biofeedback therapy and with rectal hyposensitivity. J Neurogastroenterol Motil. 2013;19(3):366-73. Epub 2013/07/23. doi: 10.5056/jnm.2013.19.3.366. PubMed PMID: 23875104; PubMed Central PMCID: PMCPMC3714415.

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years after surgery. Int Urogynecol J Pelvic Floor Dysfunct 2005;16:447–54.
5. Lantzsch T, Goepel C, Wolters M, Koelbl H, Methfessel HD. Sacrospinous ligament fixation for vaginal vault prolapse. Arch Gynecol Obstet 2001;265:21–5.
6. de Ridder D. Should we use meshes in the management of vaginal prolapse? Curr Opin Urol 2008;18:377–82.
7. Dias FGF, Dias PHGF, Prudente A, Riccetto C. New strategies to improve results of mesh surgeries for vaginal prolapses repair--an update. Int Braz J Urol 2015;41:623–34.
8. Farnsworth BN. Posterior intravaginal slingplasty (infracoccygeal sacropexy) for severe posthysterectomy vaginal vault prolapse--a preliminary report on efficacy and safety. Int Urogynecol J Pelvic Floor Dysfunct 2002;13:4–8.
9. Petros PP. Medium-term follow-up of the intravaginal slingplasty operation indicates minimal deterioration of urinary continence with time. Aust N Z J Obstet Gynaecol 1999;39:354–6.
10. Feiner B, Jelovsek JE, Maher C. Efficacy and safety of transvaginal mesh kits in the treatment of prolapse of the vaginal apex, A systematic review. BJOG 2009;116:15–24.
11. Bjelic-Radisic V, Hartmann G, Abendstein B, Tamussino K, Riss PA. The posterior intravaginal slingplasty operation, Results of the Austrian registry. Eur J Obstet Gynecol Reprod Biol 2009;144:88–91.
12. Brubaker L, Cundiff GW, Fine P, et al. Abdominal sacrocolpopexy with Burch colposuspension to reduce urinary stress incontinence. N Engl J Med 2006;354:1557–66.
13. Barber MD, Brubaker L, Burgio KL, et al. Comparison of 2 transvaginal surgical approaches and perioperative behavioral therapy for apical vaginal prolapse, The OPTIMAL randomized trial. JAMA 2014;311:1023–34.
14. Barber MD, Brubaker L, Nygaard I, et al. Defining success after surgery for pelvic organ prolapse. Obstet Gynecol 2009;114:600–9.
15. Kraus P, Krofta L, Krčmář M, et al. Řešení sestupu tří kompartmentů pomocí syntetického implantátu a sakrospinózní fixace, Kohortová prospektivní studie s délkou follow-up pěti let [The results of five years follow-up prospective study of vaginal prolapse repaired by prolift total mesh surgery or sacrospinous fixation]. Ceska Gynekol 2017;82:277–86.
16. FDA. Urogynecologic Surgical Mesh: Update on the Safety and Effectiveness of Transvaginal Placement for Pelvic Organ Prolapse, 2011. (https://www.fda.gov/downloads/MedicalDevices/Safety/AlertsandNotices/UCM262760.pdf).
17. Dirk G. Kieback. Bilateral Sacrospineous Colposuspension (BSC) in the treatment of vaginal vault prolapse - description of a novel method. Pelviperineology 2019; 38:46-48

NOTES

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